

Burke J. Minsley

U.S. Geological Survey
Crustal Geophysics and Geochemistry Science Center
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Denver, Colorado 80225

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EDUCATION

Ph.D. in Geophysics

Received June 2007

Massachusetts Institute of Technology; Cambridge, Massachusetts

Advisor: Prof. Frank Dale Morgan

Thesis title: Modeling and inversion of self-potential data

Bachelor of Science in Applied Physics

Received May 1997

Purdue University; West Lafayette, Indiana

Minor: Mathematics

EMPLOYMENT

Research Geophysicist

April 2008 - present

U.S. Geological Survey; Denver, Colorado

Crustal Geophysics and Geochemistry Science Center

- Development and implementation of novel hydrogeophysical methods
- Improved strategies for processing and interpretation of airborne electromagnetic data
- Stochastic techniques for improved geophysical model assessment and data integration

Postdoctoral Research Fellow

June 2007 – March 2008

Massachusetts Institute of Technology; Cambridge Massachusetts

Department of Earth, Atmospheric, and Planetary Sciences

Earth Resources Laboratory/Kuwait-MIT Center for Natural Resources and the Environment

- Geophysical monitoring of aquifer storage and recovery in Kuwait
- Modeling and inversion of self-potential data

Research Assistant

August 2002 – May 2007

Massachusetts Institute of Technology; Cambridge Massachusetts

Department of Earth, Atmospheric, and Planetary Sciences

Earth Resources Laboratory/Kuwait-MIT Center for Natural Resources and the Environment

- Modeling and inversion of self-potential data
- Geophysical monitoring of aquifer storage and recovery in Kuwait
- Geothermal studies in Nevis, West Indies
- Characterization of fractured reservoirs from seismic data

Research Assistant

February 2000 – August 2002

Massachusetts Institute of Technology; Cambridge Massachusetts

Department of Earth, Atmospheric, and Planetary Sciences

Experimental Sedimentology and Geomorphology Laboratory

- Helped design, build, and run scale model laboratory experiments to study turbidity flows
- Wrote data acquisition code for acoustic imaging of experimental flows

Field Geophysicist

August 1997 – June 2002

Schlumberger Geco-Prakla/WesternGeco; offshore worldwide

- Lead in-field data processing team responsible for large 2D and 3D marine seismic surveys
- Assisted with all aspects of data acquisition and ship's operations

TEACHING EXPERIENCE

Teaching Assistant/ Co-instructor

January 2004, 2006, 2007, 2008

Massachusetts Institute of Technology; Cambridge, Massachusetts
Department of Earth, Atmospheric, and Planetary Sciences

Course Title: **Alternate Energy Sources**

- Assisted with Independent Activities Period (IAP) class organization and instruction
- Co-organized class field trip: Alternate Energy in Jamaica (March 2007)

Teaching Assistant

Spring 1996

Purdue University; West Lafayette, Indiana
Department of Physics

Course Title: **Mechanics for Engineers**

- Taught three recitation sections for freshman introductory physics class

AFFILIATIONS & SERVICE

- Member of AGU, SEG, EEGS
- AGU Hydrogeophysics Technical Committee member (July 2010 – June 2012)
- Reviewer for Geophysics, Water Resources Research, Geophysical Research Letters, Journal of Applied Geophysics, Ground Water, Hydrogeology Journal, Journal of Environmental and Engineering Geophysics journals, and Department of Energy research proposals
- Session convener at Fall AGU (2004, 2006, 2007, 2008) and SAGEEP (2010, 2011) conferences
- Co-instructor for short course on Dams and Levees (SAGEEP 2010)
- Thesis committee member A. Araj (Colorado School of Mines, M.S., completed 12/2010), S. Ikard (Colorado School of Mines, Ph.D., expected graduation 6/2012)
- Supervisor for K. Huppert, USGS student volunteer through MIT Externship program (January 2011)

HONORS & AWARDS

- Paper one of 'Ten Best of SAGEEP 2010'
- USGS Geology Venture Capital Project, Funded FY2010
- Outstanding Student Paper Award, Near Surface section, Fall AGU, 2006
- NSF student travel award: Biogeophysics session at Spring AGU, May 2005
- Martin Family Society Fellowship for Sustainability, MIT, 2004 – 2005

INVITED TALKS

- Hydrogeophysics at the watershed-scale using airborne electromagnetics, NovCare Conference, Brewster, Massachusetts, May 2011
- Beyond the best model: Improved model assessment using trans-dimensional Bayesian Markov chain Monte Carlo sampling, Heiland Lecture, Colorado School of Mines, Golden, Colorado, February 2011
- Electrical resistivity parameter estimation and model appraisal using Bayesian inference, 3rd USGS Modeling Conference, Denver, Colorado, June 2010
- Interpretation of self-potential data in contaminated environments, AGU Chapman Conference on Biogeophysics, Portland, Maine, October 2008
- Modeling and inversion of self-potential data, Schlumberger-Doll Research, Cambridge, Massachusetts, May 2007

PUBLICATIONS

Linde, N., J. Doetsch, D. Jougnot, O. Genoni, Y. Dürst, **B.J. Minsley**, T. Vogt, N. Pasquale, J. Luster (2011), Self-potential investigations on a gravel bar in a restored river corridor, *Hydrology and Earth Systems Sciences, special issue on restored river corridor dynamics* 15(3): 729-742.
doi:10.5194/hess-15-729-2011.

- Minsley, B.J.**, J.B. Ajo-Franklin, A. Mukhopadhyay, and F.D. Morgan (2011), Hydrogeophysical methods for analyzing aquifer storage and recovery systems, *Ground Water*, 49(2), 250-269. doi: 10.1111/j.1745-6584.2010.00676.x.
- Ferré, T., L. Bentley, A. Binley, N. Linde, A. Kemna, K. Singha, K. Holliger, J.A. Huisman, and **B. Minsley** (2009), Critical steps for the continuing advancement of hydrogeophysics, *EOS*, 90(23), doi:10.1029/2009EO230004.
- Minsley, B.J.**, D. Coles, Y. Vichabian, and F.D. Morgan (2008), Minimization of self-potential survey mistakes acquired with multiple reference locations, *Geophysics*, 73(2), F71-F81, doi:10.1190/1.2829390.
- Minsley, B.J.** (2007), Modeling and inversion of self-potential data, Ph.D. Thesis, Massachusetts Institute of Technology, Cambridge, Massachusetts, 251 p.
- Ajo-Franklin, J.B., **B.J. Minsley**, and T.M. Daley (2007), Applying compactness constraints to seismic traveltime tomography, *Geophysics*, 72(4), R67-R75, doi:10.1190/1.2742496.
- Minsley, B.J.**, J. Sogade, and F.D. Morgan (2007), 3D source inversion of self-potential data, *Journal of Geophysical Research*, 112, B02202, doi:10.1029/2006JB004262.
- Minsley, B.J.**, J. Sogade, and F.D. Morgan (2007), Three dimensional self potential inversion for subsurface DNAPL contaminant detection at the Savannah River Site, South Carolina, *Water Resources Research*, 43, W04429, doi:10.1029/2005WR003996.
- Willis, M.E., D.R. Burns, R. Rao, **B. Minsley**, M.N. Toksöz, and L. Vetri (2006), Spatial orientation and distribution of reservoir fractures from scattered seismic energy, *Geophysics*, 71(5), 43-51, doi:10.1190/1.2235977.

USGS PUBLICATIONS

- Smith, B.D., J.D. Abraham, J.C. Cannia, **B. J. Minsley**, L.B. Ball, G.V. Steele, and M. Deszcz-Pan (2011), Helicopter electromagnetic and magnetic geophysical survey data, Swedeburg and Sprague study areas, eastern Nebraska, May 2009: U.S. Geological Survey Open-File Report 2010-1288, 37 p.
- Minsley, B.J.** and S. Ikard (2010), Geophysical investigations at Hidden Dam, Raymond, California—Flow simulations, U.S. Geological Survey Open-File Report 2010-1153, 64 p.
- Smith, B.D., J.D. Abraham, J.C. Cannia, **B.J. Minsley**, M. Deszcz-Pan, and L.B. Ball (2010), Helicopter electromagnetic and magnetic geophysical survey data, portions of the North Platte and South Platte Natural Resources Districts, Western Nebraska, May 2009, U.S. Geological Survey Open-File Report 2010-1259, 33 p.
- Eppinger, R.G., K.D. Kelley, D.L. Fey, S.A. Giles, **B.J. Minsley**, and S.M. Smith (2010), USGS exploration geochemistry studies at the Pebble porphyry CU-Au-Mo deposit, Alaska- PDF of presentation, U.S. Geological Survey Open-File Report 2010-1225, 64 p.
- Minsley, B.J.**, B.L. Burton, S. Ikard, and M.H. Powers (2010), Geophysical Investigations at Hidden Dam, Raymond, CA: Summary of Fieldwork and Data Analysis, U.S. Geological Survey Open-File Report 2009-1013, 25 p.
- Minsley, B.J.**, L.B. Ball, B.L. Burton, J.S. Caine, E. Curry-Elrod, and A.H. Manning (2010), Geophysical characterization of subsurface properties relevant to the hydrology of the Standard Mine in Elk Basin, Colorado, U.S. Geological Survey Open-File Report 2009-1284, 46 p.

PUBLICATIONS IN PROGRESS

- Minsley, B.J.**, B.D. Smith, R. Hammack, J. Sams, and G. Veloski (submitted to internal review April 2011), Calibration and filtering strategies for frequency domain electromagnetic data, *intended for Journal of Applied Geophysics*.
- Bedrosian, P.A., B.L. Burton, M.H. Powers, **B.J. Minsley**, J. Phillips, L.E. Hunter (submitted February 2011), Geophysical investigations of geology and structure at the Martis Creek Dam, Truckee, California, *Journal of Geophysical Research*.
- Araji, A.H., A. Revil, A. Jardani, **B.J. Minsley**, and M. Karaoulis (submitted February 2011), Imaging with cross-hole seismoelectric tomography, *Geophysical Journal International*.
- Minsley, B.J.** (submitted January 2011), A trans-dimensional Bayesian Markov chain Monte Carlo algorithm for model assessment using frequency-domain electromagnetic data, *Geophysical Journal International*.
- Minsley, B.J.**, B.L. Burton, S. Ikard, and M.H. Powers (submitted May 2010, in press), Hydrogeophysical investigations at Hidden Dam, Raymond, California, *Journal of Environmental and Engineering Geophysics- special issue on dam safety*.

ABSTRACTS & CONFERENCE PROCEEDINGS (PAST 12 MONTHS)

- Minsley, B.J.**, J.D. Abraham, P.A. Bedrosian, J.C. Cannia, and B.D. Smith (2011), Hydrogeophysics at the watershed-scale using airborne electromagnetic, NovCare Conference, Brewster, Massachusetts. **INVITED KEYNOTE.**
- Minsley, B.J.**, G. Hodges, B.D. Smith, and J.D. Abraham (2011), Multi-elevation calibration of frequency domain electromagnetic data, 24th Symposium on the Application of Geophysics to Engineering and Environmental Problems, Charleston, South Carolina.
- Smith, B.D., G. Hodges, **B.J. Minsley**, B. Astley, J.D. Abraham, and C. Snyder (2011), Results from two helicopter electromagnetic test lines to map permafrost, Ft. Wainwright, Fairbanks, Alaska, 24th Symposium on the Application of Geophysics to Engineering and Environmental Problems, Charleston, South Carolina.
- Sams, J., B.D. Smith, G. Veloski, B.J. Minsley, and B.L. Burton (2011), Fourth year of subsurface drip irrigation monitoring using GEM-2 electromagnetic surveys, Powder River Basin, Wyoming, 24th Symposium on the Application of Geophysics to Engineering and Environmental Problems, Charleston, South Carolina.
- Viezzoli, A., J.D. Abraham, P.A. Bedrosian, J.C. Cannia, **B.J. Minsley**, and B. Brown (2011), Fast and effective groundwater mapping from 10 to 300 m with accurate processing and inversion of SkyTEM data, 24th Symposium on the Application of Geophysics to Engineering and Environmental Problems, Charleston, South Carolina.
- Bedrosian, P.A., **B.J. Minsley**, E. Auken, A.V. Christiansen, and J.D. Abraham (2011), An intercomparison of airborne electromagnetic systems for hydrogeologic studies, 24th Symposium on the Application of Geophysics to Engineering and Environmental Problems, Charleston, South Carolina.
- Minsley, B.J.** (2010), Improved geophysical model assessment using Bayesian Markov chain Monte Carlo Sampling, Abstract NS13A-1163 presented at 2010 Fall Meeting, San Francisco, Calif., 13-17 Dec.
- Karaoulis, M., A. Revil, D.D. Werkema, and **B.J. Minsley** (2010), Time-lapse 3D inversion of spectral induced polarization measurements, Abstract NS11A-1154 presented at 2010 Fall Meeting, San Francisco, Calif., 13-17 Dec.
- Burton, B.L., C.R. Bern, J.I. Sams, G. Veloski, **B.J. Minsley**, and B.D. Smith (2010), Geophysical and geochemical characterization of subsurface drip irrigation sites, Powder River Basin, Wyoming, Abstract NS23A-1461 presented at 2010 Fall Meeting, San Francisco, Calif., 13-17 Dec.
- Araji, A., A. Revil, **B.J. Minsley**, and A. Jardani (2010), A numerical investigation of cross-hole seismoelectric conversion, Abstract NS41B-1512 presented at 2010 Fall Meeting, San Francisco, Calif., 13-17 Dec. **BEST STUDENT PAPER AWARD (NS SECTION)**
- Araji, A.H., A. Revil, A. Jardani, and **B.J. Minsley** (2010), A numerical investigation of cross-hole seismoelectric conversion, SEG 80th Annual Meeting, Denver, CO.
- Minsley, B.J.**, B.D. Smith, R. Hammack, J.I. Sams, and G. Veloski (2010), Geophysical characterization and monitoring of subsurface drip irrigation, Powder River Basin, Wyoming, USA, Australian Society of Exploration Geophysicists (ASEG), 21st International Geophysical Conference and Exhibition, Sydney, Australia.
- Abraham, J., J. Cannia, S. Peterson, B. Smith, **B. Minsley**, and P. Bedrosian (2010), Quantitative hydrogeological framework interpretations using heliborne electromagnetic surveys for the North Platte Valley, western Nebraska groundwater model, Australian Society of Exploration Geophysicists (ASEG), 21st International Geophysical Conference and Exhibition, Sydney, Australia. ****BEST PAPER AWARD**
- Minsley, B.J.** (2010), Electrical resistivity parameter estimation and model appraisal using Bayesian inference, 3rd USGS Modeling Conference, Denver, CO. **INVITED**
- Bedrosian, P.A. and **B.J. Minsley** (2010), Model assessment for non-linear geophysical inverse problems, 3rd USGS Modeling Conference, Denver, CO.
- Smith, B.D., J.S. Sams, R.C. Veloski, **B.J. Minsley**, M.A. Engle, R. Hammack, and J. Zupancic (2010), Application of geophysical surveys for characterizing near surface electromagnetic properties for the design and operation of a subsurface drip irrigation system in the Powder River Basin, Wyoming, Energy Resources and Produced Water Conference, Laramie, Wyoming.
- Smith, B.D., J.S. Sams, R.W. Hammack, R.C. Veloski, and **B.J. Minsley** (2010), Electrical geophysical studies of the Skewed Reservoir site, Beaver Creek, Johnson County, Wyoming, Energy Resources and Produced Water Conference, Laramie, Wyoming.

*** Full abstract and conference proceedings list available upon request ***